Academic literacy predicts early academic achievement of first year Bachelor of Science students

Carolien Van Soom (1) & Lieve De Wachter (2)

(1) Faculty of Science, Leuven Engineering & Science Education Center (LESEC) and (2) Leuven Language Institute, University of Leuven, Belgium

Correspondence concerning this article can be addressed to Carolien Van Soom, Tutorial Services Faculty of Sciences, University of Leuven, Celestijnenlaan 200 I, box 2105, B-3001 Leuven, Belgium, E-mail: carolien.vansoom@wet.kuleuven.be

Abstract for inspiration session

Academic bachelor programs in Science & Technology are characterized by a low academic achievement of freshmen students. These programs typically require a strong academic preparation in mathematics since math modules of varying complexity are obligatory in all first-year programs. Numerous retention studies focus on cognitive variables such as high school GPA and Math test scores as typical predictors of study success (1-3), and also coaching programs of first year students bachelor of Science programs typically focus on remediation of math skills.

Academic achievement, however, depends not only on math skills. Academic language skills have been shown to be powerful predictors of academic achievement in general (4-9). Also motivational characteristics, such as the level of autonomous motivation and academic self-concept, have been repeatedly associated with academic achievement (10-11).

To improve the study success and the efficiency of coaching programs for first year students in Bachelor of Science programs, we investigated whether entry levels of academic language skills are also important predictors in bachelor of Science programs, and to what extent motivational characteristics improve a predictive model based on cognitive characteristics.

Regression analyses showed that in all Bachelor of Science programs, the score on an academic language skills test was a significant predictor of early academic achievement, in combination with general prior achievement data and test scores on math skills. Motivational aspects had only a small additional predictive value in regression models.

Implications of these results for academic practice are discussed. Typical coaching programs for first year students in exact sciences focus exclusively on remediating math skills. The observation that academic language skills are an important indicator of students' future academic achievement, also in exact sciences, suggests that a general academic language skills test could be used to inform both science and non-science students about their chances on future study success. Diagnostic math tests have an additional value for science students, since they allow to refer students to remedial modules to train specific math skills.

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